G1030

Attachment H

COVER SHEET (PAGE 1 of 2)

May 1998 CALFED ECOSYSTEM RESTORATION PROPOSAL SOLICITATION

Proposal Title: Watershed Sediment Source Assessment Protocol & Pilot Measurement Program

Applicant Name: Napa County Resource Conservation District

Mailing Address: 1303 Jefferson Street Suite 500 B Napa, CA 94559

Telephone: (707) 252-4188

Fax: (707) 252-4219

Amount of funding requested: $123,240(+65,000) for 1 years

Indicate the Topic for which you are applying (check only one box). Note that this is an important decision: see page __ of the Proposal Solicitation Package for more information.

- ☐ Fish Passage Assessment
- ☐ Fish Passage Improvements
- ☐ Floodplain and Habitat Restoration
- ☐ Gravel Restoration
- ☐ Fish Harvest
- ☐ Species Life History Studies
- ☒ Watershed Planning/Implementation
- ☐ Education
- ☐ Fish Screen Evaluations - Alternatives and Biological Priorities

Indicate the geographic area of your proposal (check only one box):

- ☐ Sacramento River Mainstem
- ☐ Sacramento Tributary: _____
- ☐ Delta
- ☐ East Side Delta Tributary: _____
- ☐ Suisun Marsh and Bay
- ☐ San Joaquin Tributary: _____
- ☐ San Joaquin River Mainstem
- ☐ Other: _____
- ☐ Landscape (entire Bay-Delta watershed)
- ☒ North Bay: Napa River Watershed

Indicate the primary species which the proposal addresses (check no more than two boxes):

- ☐ San Joaquin and East-side Delta tributaries fall-run chinook salmon
- ☐ Winter-run chinook salmon
- ☐ Spring-run chinook salmon
- ☐ Late-fall run chinook salmon
- ☐ Fall-run chinook salmon
- ☐ Delta smelt
- ☐ Longfin smelt
- ☐ Splittail
- ☑ Steelhead trout
- ☐ Green sturgeon
- ☐ Striped bass
- ☐ Migratory birds

COVER SHEET (PAGE 2 of 2)

May 1998 CALFED ECOSYSTEM RESTORATION PROPOSAL SOLICITATION

Indicate the type of applicant (check only one box):

☐	State agency	☐	Federal agency
☐	Public/Non-profit joint venture	☐	Non-profit
☒	Local government/district	☐	Private party
☐	University	☐	Other: _____

Indicate the type of project (check only one box):

☒	Planning	☐	Implementation
☐	Monitoring	☐	Education
☐	Research		

By signing below, the applicant declares the following:

(1) the truthfulness of all representations in their proposal;

(2) the individual signing the form is entitled to submit the application on behalf of the applicant (if applicant is an entity or organization); and

(3) the person submitting the application has read and understood the conflict of interest and confidentiality discussion in the PSP (Section II.K) and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant, to the extent as provided in the Section.

R Brooke

(Signature of Applicant)

II. Executive Summary

a. **Project Title**: Watershed Sediment Source Assessment Protocol and Pilot Measurement Program
Applicant Name: Napa County Resource Conservation District

b. **Project Description and Primary Biological/Ecological Objectives**
The project has two integrated fundamental parts: development of an assessment protocol for watershed sediment sources and establishment of a pilot sediment measurement program. The applicant will select two 5 to 8 square mile sub-basins of the Napa River watershed and design a protocol to assess sources of sediment in the watershed, using the selected sub-basins as models. The applicant will establish a pilot program of measuring sediment flux at the channel boundaries of these model sub-basins, making use of the efforts of volunteers from local stewardships to help gather data in a scientifically sound manner. In addition, the applicant proposes as a separable project to obtain new orthorectified digital aerial photography of the Napa River watershed, which will greatly improve the value of the watershed sediment source assessment protocol.
The primary biological/ecological objective is the restoration of salmonid habitat in the upper reaches of tributaries, which are currently suffering from sediment imbalance. The project will directly address natural sediment supply.

c. **Approach/Tasks/Schedule**
The applicant will use the latest photographic surveys and other information to analyze selected sub-basins and prepare preliminary sediment budgets. In the field, applicant will establish sediment and discharge measurement stations, where suspended sediment flux will be measured using a combination of depth-integrated samplers and optical backscatter sensors. Applicant will produce a transferable protocol covering sediment source assessment, together with sediment and flow data from the winter 1998-99. New aerial photography, if funded, will take place as soon as possible after contract approval. Field measurements will take place November 1998 through May 1999. Assessment protocol development will take place during the same time period. Field data analysis and assessment protocol development will be completed by September 1999.

d. **Justification for Project and Funding by CALFED**
Understanding sediment sources at the watershed level is urgently needed to address the ERPP objective "Natural Sediment Supply" (ERPP Vol. 1, p. 28 ff.). The issue of sediment supply to the river system is by its nature a watershed-scale issue. The development of a protocol for assessment of watershed sediment supply will provide great benefits to local watershed stewardship, both in the Napa watershed and in the rest of the Sacramento-San Joaquin-Bay-Delta system. In the Napa River watershed, there is great current interest in watershed sediment supply to the river system. This interest arises from land use issues and the related subject of erosion and from the presence of excessive fine sediments in

large sections of the system, from gravel-bed river tributaries on down into San Pablo Bay.

The proposal will foster stewardship values in the watershed. With the assistance and encouragement of the applicant, watershed stewardship groups have become established on a number of tributaries of the Napa River; the proposed project will provide these watershed stewards the opportunity to participate in crucial data gathering near where they live or work. At the same time, the results of the sediment source assessment will help inform the current public dialogue on land issues.

e. Budget Costs and Third Party Impacts

No third party impacts are foreseen.

Budget Summary (costs to CALFED):

(dollars)	Labor	Service Contracts	Purchases	Total
Basic Project	61 000	37 650	24 590	123 240
Aerial Photos		65 000		65 000
Total	61 000	102 650	24 590	188 240

f. Applicant Qualifications

The applicant is experienced and knowledgeable in watershed analysis in this locality. Applicant also has a successful history of involving citizen volunteers in monitoring and field work. Applicant's staff have, with volunteer assistance, carried out an extensive survey of the Napa River (142 cross sections) and initiated a stream gaging program on selected creeks in the system, and staff are qualified to carry out the sediment field work proposed. Quality assurance and other technical support will be provided by partner agencies US Geological Survey (USGS) and Natural Resources Conservation Service (NRCS).

g. Monitoring and Data Evaluation

No restoration work is proposed, so there is none to monitor. Data collection sites and methods will be established with direct technical assistance from USGS and NRCS. Data evaluation will be carried out in partnership with NRCS and USGS: USGS will provide site training and quality assurance of data collection, and USGS and NRCS will provide technical support in data interpretation.

h. Local Support/Coordination with other Programs/Compatibility with CALFED Objectives

The applicant is a strongly supported local organization. The Napa County Flood Control & Water Conservation District and the City of Napa support the work and have made stream gaging equipment and stage data available. Applicant will coordinate all efforts under this proposal with prospective watershed work to be undertaken by the Flood Control & Water Conservation District or other local agencies and with a variety of studies underway or planned on the lower Napa River. The proposal is consistent with the CALFED ERPP objective of natural sediment supply and will foster improved instream habitat for salmonids.

III. Title Page

a. **Title:** Watershed Sediment Source Assessment Protocol and Pilot Measurement Project

b. **Applicant**: Napa County Resource Conservation District
1303 Jefferson Street, Suite 500B
Napa, CA 94559
Contact: Robert Zlomke
Ph. 707 252-4188 Fax 707 252-4219 E-mail hydro@napanet.net

c. **Type of Organization**: Special District of Local Government

d. **Tax Identification Number**: **94-1569332**

e. **Participants/Collaborators:** The work will be done by an agency partnership including Napa County Resource Conservation District, Natural Resources Conservation District and U. S. Geological Survey. Additional support will be provided by Napa County Flood Control District and other local partners. The individuals participating include:

Role	*Name*	*Affiliation*	*Sub-contractor?*
Coordinator, Hydrologist	Robert Zlomke	Napa RCD	No
Hydrologist	Julie Haas		
District Conservationist	Phillip Blake	NRCS	
Geologist	Vernon Finney		No
Data Interpretation	David Schoellhamer, Ph.D.	USGS	Yes
	Randal Dinehart		
Quality Assurance & Training			
Scientific Advisor	Luna Leopold, Ph.D.		No

IV. Project Description

a. Project Description and Approach: The proposed work will create a transferable protocol, suitable for tributary watersheds of the Sacramento-San Joaquin-Bay-Delta system, for the assessment of sediment sources at the watershed level. The protocol will be developed initially for two selected sub-basins of the Napa River watershed, in order to assess the Napa River watershed as a whole. The assessment will use the best current information available on landforms, vegetation, land use practices and channel conditions to fashion a tool to help the community develop strategies for sediment supply management. As this assessment is being completed, steps will be taken to measure sediment supply in focused field work. A pilot sediment monitoring program will be established to begin determination of watershed sediment yield from direct measurements of sediment flux in tributary channels and related measurements of channel cross sections.

Two 5 to 8 square mile sub-basins of the Napa River watershed will be selected for analysis. The selection will be made on the basis of input from community organizations, stewardship groups and local agencies, taking into account the following considerations:

- Habitat restoration potential
- Stewardship interest
- Present and projected trends in land uses
- Availability of suitable sediment and discharge gaging sites

These model sub-basins will be used to develop the assessment protocol, and sediment stations will be established on the tributary channels at the boundaries of each sub-basin. The goal of the work will be to develop an understanding of sediment transport in these tributaries in general and of watershed sediment supply in particular. The value of the assessment produced will be greatly increased if funding is approved for a new digital orthorectified aerial photographic survey of the watershed, which is the subject of a separable section of this proposal. The orthorectified digital aerial photographic survey, if funded, will reflect actual current conditions in the watershed, which our existing information from 1989 does not; in addition, it will allow efficient and accurate assessment of lengths, slopes, areas, land uses, vegetative cover, and the like.

In any case, if the basic project is funded by CALFED, information will be collected from the best available sources on geology, soils, topography, land use, and channel conditions for the selected sub-basins. Particular attention will be paid to physical processes on hillslopes and in the creek channels. This work will make use of the best aerial photos available, maps, the *Napa County Soil Survey*, and other information. The information will be used to develop a picture of sediment sources in the model sub-basins, forming the basis for the protocol we will develop.

At the sediment stations associated with the model sub-basins, a continuous record of sediment flux will be derived from optical backscatter measurements calibrated by means of isokinetic depth-integrated sampling. In addition, bed load samples will be taken and pumping samplers used to take samples at suitable locations.

The measured data will be used to develop a pilot program of quantitative estimates of watershed sediment yield. A sediment budget for each tributary will be made and related to the sediment source assessment. Sediment-discharge rating curves will be constructed, as well. Other projected uses of the data include the following:

- Use of the rating curves to estimate annual sediment loads, making possible comparisons between tributaries on a storm-by-storm or annual basis.
- Use of the sediment flux record itself to study the relationship of suspended load to timing within a storm hydrograph or the water year as a whole.

The measured data will make it possible to develop better rating curves for suspended sediment load in the tributaries than would be possible with spot measurements alone. Spot measurements by volunteer monitors will be essential, of course, to provide calibration data for the optical backscatter measurements. The applicant will train carefully selected volunteers from local stewardship groups to collect samples and to maintain optical backscatter sensors. We will make use of a protocol to be developed by Luna Leopold for volunteer sediment sample collection. Applicant agency's extensive experience with volunteer monitoring will help ensure that the work is done properly and efficiently and that local community involvement and interest are heightened.

In order to get a reliable picture of watershed sediment supply, collection of data over a period of years is essential. If this proposal is funded, further funding for continued implementation in subsequent years will be supplied by locally generated tax revenues augmented as necessary by other sources, including CALFED.

b. Proposed Scope of Work

Task I. Develop protocol and carry out sediment source assessment

Task Ia. Select sub-basins for analysis
Completion September 1998

Task Ib. Collect information on geology, soils, topography, land use, channel condition, etc.
Completion January 1999

Task Ic. Using information collected in ***Ib***, determine areal extent of vegetation types and land use practices and estimate the effects of hillslope processes (overland flow, sheet & rill erosion) and channel processes (bank erosion, bed degradation & aggradation, bar movement, debris dams, etc.) on sediment supply
Completion March 1999

Task Id. Produce a written sediment source assessment protocol
Completion September 1999; deliverable: written protocol

Task II. Establish pilot sediment measurement program
Task IIa. Establish streamgage and sediment stations at boundaries of sub-basins identified in ***Ia*** above
Completion November 1998
Task IIb. Develop a discharge rating curve for the sediment stations, using appropriate means to measure current
Completion May 1999; deliverable: set of discharge rating curves
Task IIc. Make sediment flux measurements at sediment stations. Deploy optical backscatter sensors for the wet season (November – May, approximately); make calibration sampling measurements using a depth-integrated sampler. Make appropriate use of volunteer work. Establish an auxiliary program of measurement of bed load samples, using a Helley-Smith sampler, and of field runoff using a pumping sampler.
Completion May 1999; deliverable: raw sediment data
Task IId. Calibrate optical backscatter data and carry out analysis of all data
Completion September 1999; deliverable: report of analyzed sediment data with recommendations for further sediment measurements

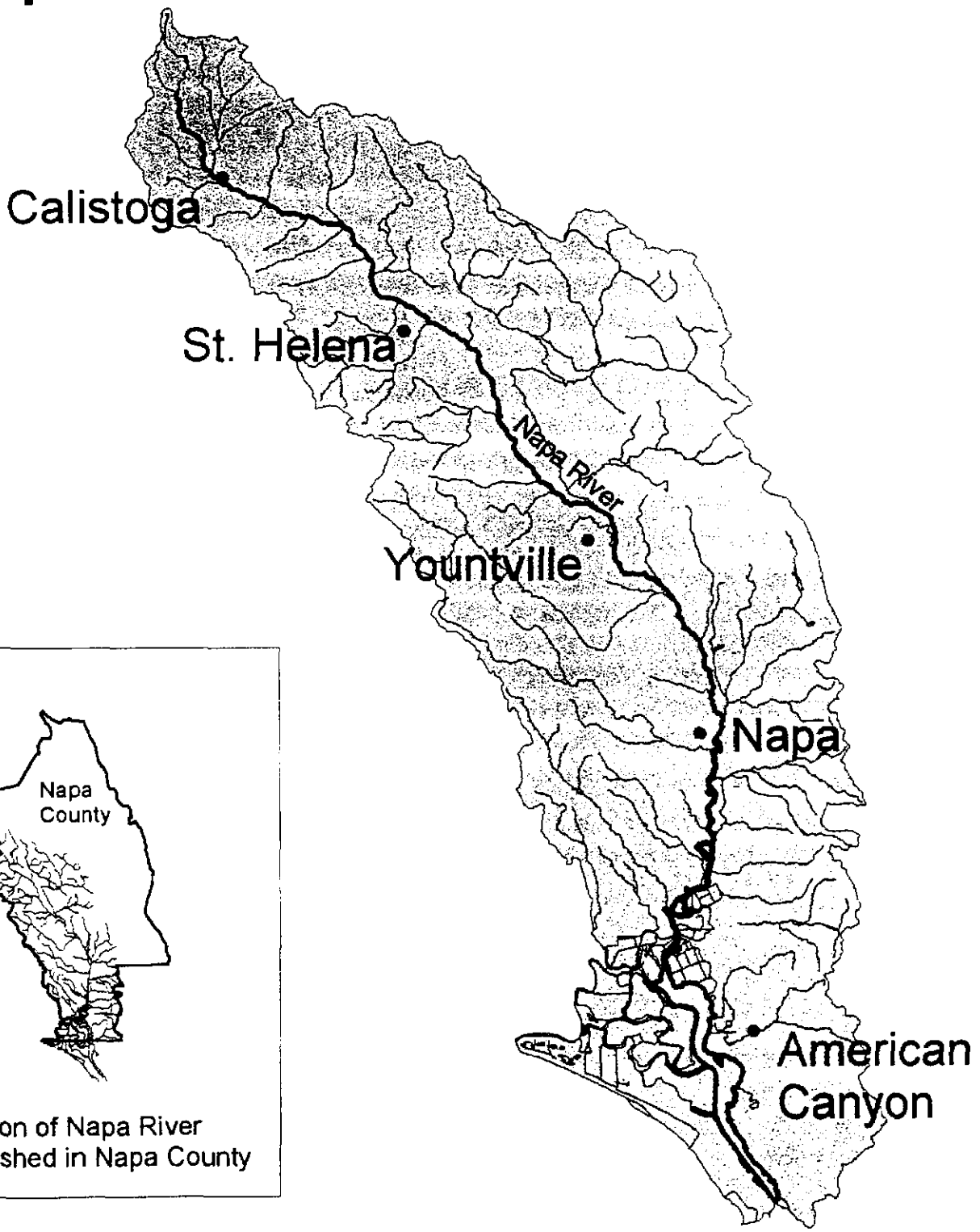
Separable Task III. Obtain new digital orthorectified aerial photography of watershed
Completion November 1998; deliverable: digital photographic survey

c. **Location of the Project**: The Project will assess sediment sources within the Napa River watershed, which makes up the western and southern portion of Napa County and drains into the Carquinez Strait at Mare Island (see figure). The Napa River watershed is historically habitat for Coho salmon, although the native race was extirpated by 1967, and it currently has populations of other salmonids, notably steelhead. Spawning streams are impaired because of long-term changes in sediment supply and transport.

d. **Expected Benefits**: The proposed work will benefit instream aquatic habitat for salmonids, by developing a protocol for the watershed-level sediment source assessment which is key to the restoration of natural sediment supply. Development of this protocol will be accompanied by field measurements intended to determine the nature and source of the sediment supply. In addition, the work will directly foster watershed stewardship by developing tools for watershed-level planning on the basis of community stewardship activity, in Napa County and elsewhere in the Sacramento-San Joaquin-Bay-Delta system.

e. **Background and Technical Justification:** Understanding sediment sources at the watershed level is urgently needed to address the ERPP objective "Natural Sediment Supply" (ERPP Vol. 1, p. 28 ff.). The issue of sediment supply to the river system is by its nature a watershed-scale issue, and it is a topic of

Napa River Watershed



Napa County Resource Conservation District
Creek data layer from USGS 1:100,000 DLG, UTM Zone 10.

considerable concern in the Napa River watershed. There is an apparent oversupply of fine sediment in the river and tributary channels; excess fine sediment is thought to be a principal water quality impairment of the river. At the same time, considerable public interest in erosion from agricultural lands, especially newly developed hillside agricultural activities, has sharpened the issue. There is sentiment in favor of restricting hillside development, largely because of the erosion and sediment issues. However, there are no historical or present data available to quantify the sediment regime. For these reasons, Napa is a good place to develop concepts of watershed-level planning to address sediment issues, and the proposed protocol and measurement program can be a key contribution to the effort.

The project is new. However, the applicant has extensive experience in developing watershed-level plans, beginning with the *Napa River Watershed Owner's Manual* (1993) and including participation in many watershed-wide and local stewardship efforts, and it is hoped that this project will spur the local community to further efforts.

The work done under this project will have an additional enduring benefit insofar as it results in a useful protocol which will make it easier for other watersheds to cover some of the same ground.

f. **Monitoring and Data Evaluation**: No restoration work is proposed, so there is none to monitor. Data collection sites and methods will be established with direct technical assistance from USGS and NRCS. Data evaluation will be carried out in partnership with NRCS and USGS: USGS will provide site training and quality assurance of data collection, and USGS and NRCS will provide technical support in data interpretation.

h. **Implementability**: Sediment stations established under this proposal will be located with the permission of willing landowners. The proposal complies with all applicable laws and regulations, including the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). Work will commence only when a funding agreement is signed. Applicant will coordinate all efforts under this proposal with prospective watershed work to be undertaken by the Flood Control & Water Conservation District or other local agencies and with a variety of studies underway or planned on the lower Napa River. The proposal is consistent with the CALFED ERPP objective of natural sediment supply and will foster improved instream habitat for salmonids.

V. Costs and Schedule

a. **Budget Costs**: The total request for funding by CALFED is broken down in the table which follows. In-kind contributions by the applicant and agency partners are not included. Separable Task III is included in the table.

Project Task	Direct Labor Hours	Direct Salary and Benefits	Overhead Labor	Service Contracts	Material and Acquisition Contracts	Miscell. and other Direct Costs	Total Cost
Ia	200	4 350					4 350
Ib	200	3 500					3 500
Ic	300	5 250					5 250
Id	200	8 700					8 700
IIa	150	3 050		4 800	16 540		24 390
IIb	450	9 150		4 800			13 950
IIc	800	16 550		16 050	8 050		40 650
IId	500	10 450		12 000			22 450
III				65 000			65 000
Total	3000	61 000		102 650	24 590		188 240

In-kind contributions by the applicant, agency partners, cooperating local agencies, stewardship volunteers and others are summarized in the table below:

Project Task	Direct Labor Hours	Direct Salary and Benefits	Others' hours	Services by others	Equipment and Materials Furnished	Overhead & other Indirect Costs	Total Value
Ia	80	1 400	80	480			1 880
Ib	80	1 400	80	480			1 880
Ic							
Id							
IIa	80	1 400					1 400
IIb	320	7 250	500	3 000	5 000		15 250
IIc			500	3 000	4 500		7 500
IId			40	2 400			2 400
III							
Total	560	11 450	1100	9 360	9 500	10 000	40 310

In-kind contributions of direct salary and benefits represent the labor of applicant's staff beyond the amounts for which funding is requested. Equipment of the value shown will be furnished by applicant, USGS and Napa County Flood Control & Water Conservation District. Services by others include services by volunteers, conservatively valued at minimum wage, and services by NRCS. Applicant will provide funding for all overhead and other indirect costs, which are conservatively estimated at $10,000. Applicant realizes that the pilot measurement program proposed will need further funding beyond what is requested here. In order to get a reliable picture of watershed sediment supply, collection of data over a period of years is essential. If this proposal is funded by CALFED, applicant will respond to future CALFED solicitations and seek other funding sources to augment locally generated funds, for continued field data collection in future years.

b. **Schedule Milestones**: Work is expected to begin September 1, 1998, if funding can be obligated by that date. Completion of tasks should be as follows:

Task Ia, sub-basin selection:	September 1998
Task IIa, sediment station establishment:	November 1998
Task Ib, information gathering:	January 1999
Task Ic, information analysis:	March 1999
Tasks IIb,c, field measurements:	May 1999
Tasks Id, IId, written products:	September 1999

c. **Third Party Impacts**: No third party impacts are anticipated from implementation of the project.

VI. Applicant qualifications

The applicant is experienced and knowledgeable in watershed-scale monitoring and modeling and related analysis. Applicant also has a successful history of involving citizen volunteers in monitoring and field work. Applicant's staff have, with volunteer assistance, carried out a variety of watershed monitoring projects, including an extensive survey of the Napa River (142 cross sections). Applicant's staff have devoted considerable time over the last two years to the hydrologic field work and related analysis necessary to develop discharge rating curves for creek sites in the Napa River watershed.

Applicant is very familiar with watershed sediment supply as a community issue. Applicant staff have for several years evaluated erosion control plans for proposed hillside agricultural development projects, under a joint powers agreement with Napa County Department of Conservation, Planning and Development. Applicant staff participated in the community coalition effort which resulted in the Napa River flood control project, in which sediment in the river was a key technical issue.

NRCS staff have considerable local experience dealing with these same issues. This project will benefit additionally from the expertise of a geologist from the NRCS State Office Water Resources Planning Staff.

The extensive expertise of USGS in providing quality assurance of discharge and sediment transport field data will ensure that samples taken by staff and volunteers meet USGS standards. USGS research hydrologists are experienced in interpretation of optical backscatter data and other data to be collected.

Brief biosketches of key applicant personnel are listed below.

Robert Zlomke, Hydrologist, Napa County Resource Conservation District

Highlights of work at the district:

- Coordinated Napa River survey, 1995/96 (142 cross sections covering entire main stem of river above Trancas Street, with level control).
- Trained volunteer surveyors and developed spreadsheet applications for survey data entry.
- Developed computer programs to reduce volunteers' survey notes and format them for model input.
- Developed Napa River model using Mike 11 software, 1995-96.
- Assisted Napa County Flood Control District staff with ALERT system stream gage placement and planning, 1996-97.
- Carried out pilot model of flooding on Napa Creek system using HEC-1 with Napa City ALERT system data, 1997.

- Expanded RCD modeling capabilities by the acquisition of new software programs from DHI and others.
- Initiated stream discharge measurement program on Napa River tributaries, 1996-98

Author of watershed modeling studies and *Water Quality Modeling in the Sacramento-San Joaquin Delta*, Center for Environmental and Water Resources Engineering, Department of Civil and Environmental Engineering, University of California, Davis, Report No. 95-1, February 1995.

Julie Haas, Assistant Hydrologist, Napa County Resource Conservation District

Highlights of work at the District

- Assisted with development of discharge rating of Huichica Creek.
- Derived land cover and permeability information from air photos and USGS quad sheets and used it in hydrologic modeling with HEC-1 and other modeling tools.
- Used GIS and other tools to analyze data and modeling results.
- Developed computer programs to format data for model input.
- Surveyed cross-sections and longitudinal profiles of various local creeks.
- Designed and managed a riparian vegetation analysis with volunteers at Huichica Creek.
- Worked on design and installation of willow revetment and other bank stabilization projects.
- Trained volunteer monitors and creek surveyors.
- Conducted fish habitat survey on Dry Creek, 1997.

Previous relevant experience:

- Completed a riparian vegetation investigation of the Shasta River basin, and monitored water quality on the Klamath and Shasta Rivers. Managed and analyzed the data generated.

VII. Compliance with Standard Terms and Conditions

We have in place all policies necessary to meet the requirements to comply with state and federal funding. We agree to the terms and conditions as set forth in Attachment D, Table D-1 of the Proposal Solicitation Package. We will submit appropriate forms at the time of contract completion, as per Attachment D, Table D-1 of the Proposal Solicitation Package.